Potential Extracorporeal Membrane Oxygenation Use for Increased Survival of In-Hospital Cardiac Arrests

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Background

In-hospital cardiac arrest (IHCA) is a relatively uncommon event but is associated with a low rate of survival.

Extracorporeal membrane oxygenation (ECMO) is a highly aggressive and advanced cardiopulmonary support system that can benefit select patients who cannot be successfully resuscitated through traditional cardiopulmonary resuscitation (CPR). It temporarily allows for adequate bodily perfusion in patients in refractory cardiac arrest and allows for valuable time so that the pathologies behind the cardiac arrests can be evaluated and treated.[1]

Methods

A retrospective study was done involving 182 patients in 2011 and 2012 within the Lehigh Valley Health Network for which a "code blue" was called for an in-hospital cardiac arrest.

Data was examined for each patient from electronic medical and resuscitation records. The overall exclusion criteria was an age <18 or >70 years or an existing Do Not Resuscitate (DNR) before coding.

REFERENCES

1 Lazzeri C., Bernardo P., Sori A., Innocenti L., Stefano P., Peris A., gensini G.F., Valente S. Venous-arterial extracorporeal membrane oxygenation for refractory cardiac arrest: a clinical challenge. *Eur Heart J Acute Cardiovasc Care* 2013; 2: 118-26.

2 Haneya A., Philipp A., Diez C., Schopka S., Bein T., Zimmermann M., Lubnow M., Luchner A., Agha A., Hilker M., Hirt S., Schmid C., Muller T. A 5-year experience with cardiopulmonary resuscitation using extracorporeal life support in non-postcardiotomy patients with cardiac arrest. *Resuscitation* 2012; 83: 1331-37.

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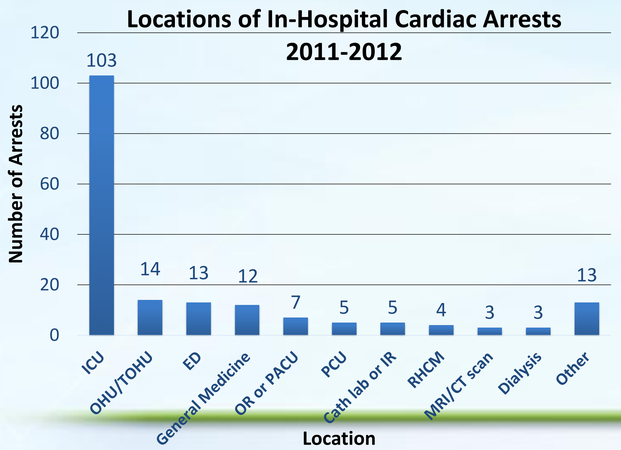
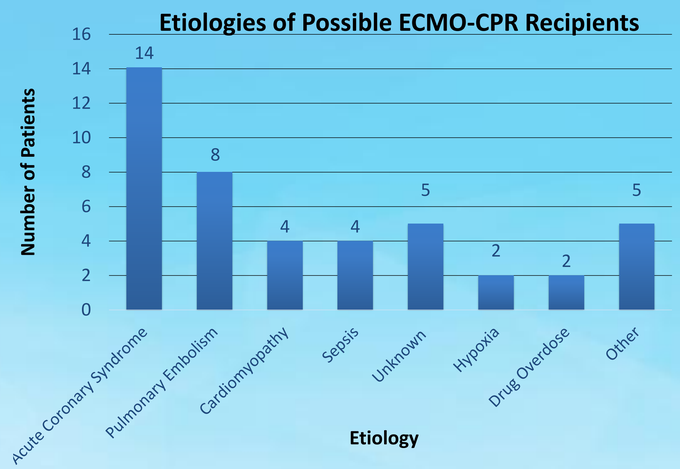
Results & Figures

	Male	Female	Total
Total IHCA patients (%)	108 (.59)	74 (.41)	182
Survivors to 30 days (%)	25 (.23)	26 (.35)	51 (.28)
No Return of Circulation (ROC) >20 min	49 (.45)	26 (.35)	75 (.41)
ROC >20 min (%)	59 (.55)	48 (.65)	107 (.59)
DNR after 1st code (%)	14 (.24)	9 (.19)	23(.22)
ROC but do not Survive to 30 days	33 (.56)	21 (.44)	56 (.52)
Multiple Cardiac Arrests (%)	25 (.42)	10 (.21)	35 (.33)
Survival after multiple Cardiac Arrests (%)	2 (.08)	0	2(.06)

TABLE 1. IHCA General Data Male v Female. This table shows general IHCA data numbers for males, females, and overall totals.



Results



Of the 131 patients that could not be permanently resuscitated, 44 would have been good candidates for ECMO-CPR. Previous studies have found survival rates for patients undergoing ECMO-CPR due to IHCA to be 30-42%.[1,2] This indicates that approximately 13-18 additional patients could have survived at LVHN in 2011-2012, increasing the overall IHCA survival rate from 28% to 37%.

Conclusions

Introducing ECMO-CPR for select IHCA patients in the Lehigh Valley Health Network is a realistic way to produce positive outcomes for patients who would otherwise face grave prognoses and better the overall survival statistics for IHCA.